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## **Association between poverty indicators and social relations**

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### **Abstract:**

We analyse the association between poverty indicators and social relations using nationally representative data from Hungary. We focus on four poverty indicators (the three standard indicators of Eurostat and perceived financial problems) and a rich set of social relationship indicators (eighteen variables). Material deprivation is the most strongly linked to the measures of social ties and social integration, whereas income poverty is associated the least strongly with them. Although income poverty is probably the most widely used poverty indicator, our results suggest that material deprivation and even subjective poverty reflect better the multidimensional nature of poverty and social exclusion.

### **Keywords:**

poverty; material deprivation; social exclusion; social relations; social integration

## Association between poverty indicators and social relations

### 1. Introduction

For people living in poverty, social support available through interpersonal networks is particularly important since it can decrease the negative impacts of their disadvantaged economic circumstances. It might be beneficial – among other things – through helping to find a job, through better stress management, through enabling the poor to seek easier access to financial resources and public services (Saegert *et al.* 2001). The theories of social capital also emphasize that it is embodied in interpersonal relationships (Bourdieu 1986; Coleman 1988; Daly and Silver 2008; Portes 1998) and in certain cases can be converted into economic capital (Bourdieu 1986).

Social relations, social integration or social cohesion are of basic importance in themselves, not only as coping resources. Social disintegration may cause anxiety and depression, decrease well-being and lead to increased morbidity and mortality (Putnam 2000; Wilkinson 1996), while social integration or social embeddedness enhances the formation of realistic expectations and conformity to norms (Coleman 1988; Granovetter 1985).

Although research on social inequalities and poverty has highlighted that the lack of economic resources has social consequences (Sen 1983; Townsend 1979), most poverty indicators measure only the material dimensions of poverty, disregarding the role of social relations, although the concept of *social exclusion* explicitly refers to the fact that having a proper number and quality of social relationships is an essential feature of social integration (Daly and Silver 2008; Levitas 2006; Townsend 1979). Social exclusion highlights the multi-dimensional, dynamic and relative nature of poverty, however, its social connotations still often remain in the background (European Commission 2004; Layte *et al.* 2010).

In this paper, our aim is exploratory. We analyse the association between poverty indicators and various dimensions of interpersonal networks and social integration, using nationally representative data from Hungary. Our main research question concerns which poverty indicators are linked most strongly with the indicators of social relationship structure and social integration. Regarding poverty indicators, we focus on the three standard and widely used indicators of Eurostat: relative income poverty, severe material deprivation, living in a household with very low work intensity<sup>1</sup>, and on a subjective poverty indicator: the perceived

financial situation of the household. As measures of interpersonal social networks and social integration, we rely on seven groups of indicators (eighteen variables) that reflect the multiple aspects of a person's social connectedness (Zavaleta *et al.* 2017).

Numerous papers have studied the relationship between poverty and interpersonal social networks or social integration. However, they have based their analyses on one poverty indicator (Böhnke 2008; Böhnke and Link 2017; Canduela *et al.* 2015; Eckhard 2018) or used only a small number of poverty and/or social network indicators (Dahl *et al.* 2008; Mood and Jonsson 2016). Our paper contributes to this literature by asking which of the four widely used poverty indicators is associated the most strongly with dimensions of interpersonal networks and social integration. Secondly, we use a rich set of social indicators that could provide a broader and more in-depth picture of this association. Thirdly, previous studies focusing on a single country have used data from Western Europe, but evidence from Central and Eastern Europe is still missing, although in this region the poverty rate is much higher than in Western Europe (Eurostat 2018), whereas the level of social capital is lower (Howard 2003; Völker and Flap 2001). Thus, our results could reveal interesting evidence about the relationship between poverty and social integration in an economically more disadvantaged region.

Our article is structured as follows. First, we review the previous literature (Section 2). Then, we describe the data, the variables and the estimation method (Section 3). In Section 4, we show our results, in Section 5, we discuss the limitations. Section 5 concludes.

## **2. Previous literature**

Regarding the relationship between disadvantaged economic circumstances and social relations, there are three possible scenarios, which, due to limitations regarding the length of the paper, are only briefly described. First, maintaining relationships and meeting other people require the investment of resources poor people lack (most importantly money, but also time, favours, etc.). They have more limited opportunities not only for meeting people but also to reciprocate favours, to provide support, hence the balance in relationships cannot be sustained and individuals may withdraw or become excluded from relationships, especially those beyond close family ties. Hence, poverty may result in social disintegration and more limited social networks; in other words, low living standards endanger interpersonal relationships (accumulation hypothesis). Second, in contrast, it is also possible that solidarity and social support increase when someone is in a disadvantaged situation, or someone in such a situation seeks more social support and invest more in his/her social relationships expecting returns. Hence, when being poor, relationships, especially family ties, and more so in welfare states

providing limited assistance (e.g. Böhnke 2008; Paugam 1996) may gain further significance since they might help to escape the disadvantaged situation (compensation hypothesis).<sup>2</sup> Third, it is possible that poverty and worse social integration are both outcomes of a third variable. For example, health status has an effect on income (Bonds *et al.* 2010; Currie 2009; Oreopoulos *et al.* 2008) and also on social relations (Lamu and Olsen 2018; Ren *et al.* 1999; Sirven and Debrand 2012).

Most of the empirical papers use cross-sectional data, therefore reports results about the association between poverty and social ties or social integration. Walker (2014) shows that the lack of money is stigmatizing in itself and people in poverty feel ashamed of being unable to fulfil society's expectations and their personal aspirations. Therefore, they may withdraw from social relations to hide their difficult financial status and the resulting unpleasant situations. In addition, participation in social life and relationship maintenance require economic resources, for example using a mobile phone or having access to the Internet, participating in several free-time activities, let alone the fact that the lack of money may also be a significant source of interpersonal conflict in kin and non-kin relations (Conger *et al.* 1992). Similar results were found for children: financial vulnerability of the family is associated with lower social, emotional and behavioural (SEB) well-being of the children, including worse peer relationships (Treanor 2016).

The stigmatizing nature of poverty and the homophilic nature of social networks (McPherson *et al.* 2001) suggest that the resource strength of networks of the poor is lower, as their network is more likely to consist of similarly disadvantaged people. This claim is supported by Letki and Mieriņa (2015), who find that even if the poor maintain networks that are at least as extensive as those of more affluent people, their networks are less useful for accessing resources. These results suggest that poverty might be associated not only with the size but also with the quality of interpersonal networks.

The research of Pichler and Wallace (2009) shows that social capital is stratified by social status, and the major differences have been identified regarding formal social capital (participation in civil society), whereas regarding the intensity of keeping contact with friends, family members or neighbours, they have observed much smaller differences between social classes. Similarly, van Oorschot *et al.* (2006) find on the European level that social capital correlates positively with economic and human capital. Using data from the European Quality of Life Survey, Böhnke (2008) notes that higher social status is linked to more network resources.

Other papers, using panel data, are able to make causal claims. Böhnke and Link (2017)

analyse how social relationships change when someone falls into poverty. Using longitudinal data of the German Socio-Economic Panel, they provide evidence that poverty has negative effects on weak social ties and on a broader network of loose acquaintances, but it has no impact on ties to family members and close friends. Similar results have been reported in Germany (Eckhard 2018), and in Norway (Dahl *et al.* 2008). Canduela *et al.* (2015), using the British Household Panel Survey, find that social relations are beneficiary in gaining employment for people in poverty. Mood and Jonsson (2016) find that consequences of economic deprivation are more stable than those of absolute or relative poverty, and also – in line with the findings of Böhnke and Link (2017) – that the negative consequences of poverty are less marked for close social relations.

Although these papers provide important insights about the link between poverty and interpersonal relations or social integration, they show only one aspect of a bigger picture since they base their analyses on one poverty indicator (almost exclusively income poverty) or use only a small number of poverty and/or social network indicators. We aim to extend this literature in an exploratory way. Using the standard set of poverty indicators of Eurostat, supplemented by the indicator of the perceived financial situation and seven groups of social indicators that reflect the multiple aspects of a person's social connectedness, we will show a broader picture of the relationship between poverty and social relations.

Our work also relates to papers emphasizing that although social relations are so fundamental that some argue that social isolation is an intrinsically important component of poverty (Narayan *et al.* 2000; Sen 2000), poverty indicators are dominantly suitable for the analysis of the distribution of material resources, and do not focus on the existence or quality of social bonds and the relationship-side of social inclusion. Hence, they cannot successfully link the “social” and the “material” understandings of social exclusion (Daly and Silver 2008). There has been growing efforts to measure relational deprivation (Mills and Zavaleta 2015; Samuel *et al.* 2018; Zavaleta *et al.* 2017) but the results of these processes, have not yet been incorporated in poverty measurement.

Another line of papers draws attention to the limitations of current income in identifying poor people (Ravallion 1994; Sen 1979; Short 2005). Firstly, it is almost impossible to properly measure income (Atkinson *et al.* 2002). Moreover, income is only one, although indeed a key element of the resources available to households. However, non-cash income and services received from formal and informal providers are also important resources for households. Secondly, household needs and expenditures may significantly differ by geographic location, time and social status. Several low-income households can avoid deprivation by receiving

support from their families or living on formerly accumulated assets. Although even if the circles of the income-poor and the deprived overlap, they are not identical (Israel 2016), and this is also true for those identified by experiencing self-assessed economic difficulties (Nolan and Whelan 2011; Short 2005). Thus, it seems reasonable to test which poverty indices used as standard indicators in the European Union are linked most to the characteristics of interpersonal networks and social integration.

### **3. Data and methods**

#### *3.1. Data*

Our analysis is based on a nationally representative Hungarian survey conducted by the Institute of Sociology of the Hungarian Academy of Sciences and the TÁRKI Social Research Institute in 2015.<sup>3</sup> The initial sample size was 2,687.

#### *3.2. Variables*

We measure living at risk of poverty or social exclusion by the three standard indicators of Eurostat:

- (1) relative income poverty
- (2) severe material deprivation
- (3) very low work intensity (Eurostat 2013).

Although in its report, the European Commission (2004) states that people living in poverty or social exclusion may experience multiple disadvantages and are often excluded from social and cultural activities, the three indicators are primarily economic and provide information on the monetary requirements of participation in social and cultural life.

Relative income poverty is measured using equivalent net household income. Respondents living in a household with an equivalent net income below the threshold of 60% of the median equivalent income are classified as living in monetary poverty.

Material deprivation is measured by nine indicators of lack of resources. Respondents are classified as living in material deprivation if they experience at least four deprivation items. These items are the following: they live in a household that cannot afford (1) avoiding arrears (in mortgage, rent or utility bills), (2) a week's holiday away from home, (3) eating meat, chicken, fish or vegetarian equivalent every other day, (4) keeping the home adequately warm, (5) coping with an unexpected expense, (6) a car, (7) a washing machine, (8) a colour tv, (9) a telephone.

Living in a household with very low work intensity is defined as living in a household where working-age adults worked less than 20% of their total work potential during the previous 12 months.<sup>4</sup>

As a subjective indicator of poverty, we use the perceived financial situation of the household. Respondents were asked how their household can cover the usual expenses on a 6-point scale. Respondents are classified as living in a household with perceived financial problems if they report that the household covers the usual expenses with large difficulties or with difficulties.

We use seven groups of indicators of interpersonal networks and social integration that reflect different dimensions of social relationships and social integration: (1) The size of social network, as with increasing network size, people have a greater number of social resources to draw upon and are less likely to experience loneliness (Binder *et al.* 2012). (2) The quality or composition of social network, as previous research has consistently shown that different types of social contacts serve different purposes and provide different provisions (Wellman and Wortley 1990). (3) Subjective indicators of social life and integration that can reflect the individuals' own evaluations about their circumstances and can provide additional information compared to objective indicators (Diener *et al.* 2009). (4) The patterns of social interactions are also important characteristics of networks (Allan 1998) (5) The importance of other people reflects the subjective evaluation of social relationships and interactions. (6) The perceived characteristics of the neighbourhood indicate the social quality of the neighbourhood where individuals live and which represent important constraints for interpersonal relationships. (7) Public participation reflects an individual's involvement in the wider local neighbourhood or in society.

The first group of indicators measures the size of the social network. We use four indicators: (1) core discussion network size, (2) the number of instrumental strong ties, (3) the number of friends, and (4) social isolation. Two name generators are used to measure the size of the core discussion network (CDN) and the number of instrumental strong ties. Respondents were asked to name people with whom they discuss intimate and personal matters and from whom they get help with everyday tasks, respectively. They could list up to five people in each of the two situations. The number of friends is measured with a single question ("How many friends do you have?"). Lastly, social isolation measures how many of the three types of social contact are lacking, i.e. the variable ranges from 0 to 3. This variable relates to a binary concept of social disconnectedness or extreme cases of social isolation.

We use three indicators of the composition of the social network. (1) Nexus diversity is measured with the position generator technique (Lin and Dumin 1986). Given a list of 21 occupations, respondents were asked to indicate if they know and can get help from people having those jobs. Nexus diversity is calculated as the number of occupations indicated. (2) The share of highly educated people in the core discussion network is based on the number of contacts with a high school degree in the CDN. (3) The average prestige of the occupations in which the respondent knows at least one helpful person is based on the prestige scores (from Treiman's Standard International Occupational Prestige Scale) of the occupations the respondents had contact with. These variables capture resource strength.

The group of subjective indicators of social life and integration consists of three variables. (1) perceived social exclusion, (2) perceived social importance, and (3) satisfaction with family life. We measure perceived social exclusion with four questions used in the European Quality of Life Survey (Layte *et al.* 2010). Respondents were asked to indicate their agreement with the four statements on a 5-point scale (from 1 – ‘strongly disagree’ to 5 – ‘strongly agree’):

- a) I feel left out of society.
- b) Life has become so complicated today that I can hardly find my way.
- c) Some people look down on me because of my job situation or income.
- d) I don't feel the value of what I do is recognized by others.

The measure of perceived social exclusion is created as the mean of the four variables. Perceived social importance is measured with a single-item question: respondents were asked to indicate the extent they think they are important members of society on an 11-point scale (from 0 – ‘not at all important’ to 10 – ‘absolutely important’). Satisfaction with family life is also measured on an 11-point scale (from 0 – ‘extremely dissatisfied’ to 10 – ‘extremely satisfied’).

To address social interactions, we look at the frequency of meeting friends at home, which requires more time and effort but is supposed to require less money than going out with friends. Hence, it might capture the social and psychological consequences of poverty rather than its financial constraints. We use a binary variable that measures if a respondent never or rarely meets friends.

The fifth group of indicators measures the importance of others in one's life: (1) family, (2) friends, and (3) neighbours. Respondents were asked to indicate the importance of the three groups on a 5-point scale (from 1 – ‘not important at all’ to 5 – ‘very important’).



We measure the social quality of the neighbourhood with two variables. Respondents were asked to indicate the extent they think six characteristics or activities apply in their neighbourhood: (1) people know one another, (2) neighbours visiting each other, (3) helping each other, (4) openness and acceptance, (5) envy, rivalry, (6) malignancy, hostility. We create two factors. The first reflects the positive characteristics of the neighbourhood (1-4), the second represents the negative characteristics of the neighbourhood (5-6).<sup>5</sup>

Lastly, we use two measures of public participation. (1) The variable of participation in NGOs indicates whether respondents participated in the work of any NGOs in the previous 12 months. (2) The second indicator is participation in political activities. Respondents were asked if they participated in any of eight political activities in the previous 12 months. The scope of these activities was broad: the list included activities ranging from contacting a politician or local government official, through taking part in a lawful public demonstration to signing a petition.<sup>6</sup> The variable indicates whether respondents participated in any of the eight political activities.

Summary statistics of the four measures of poverty and the indicators of social ties and social integration are shown in Table 1.

[TABLE 1 HERE]

### 3.3. Empirical strategy

Our research question concerns which poverty indices used as standard indicators in the European Union are linked most to the characteristics of interpersonal networks and social integration. Thus, we regress the indicators of social ties and social integration on each of the four indicators of poverty. We estimate the following equation:

$$S_i = \beta_0 + \beta_1 P_i + \beta_2 \mathbf{X}_i + \varepsilon_i, \quad (1)$$

where  $S_i$  is the indicator of social ties and social integration,  $P_i$  is one of the four the indicators of poverty,  $\mathbf{X}_i$  is the vector of personal characteristics of the individual.<sup>7</sup> Finally, the equation includes the usual error term ( $\varepsilon_i$ ). We estimate equation (1) using an OLS regression.<sup>8</sup> Sampling weights are used to adjust for the unequal inclusion probabilities. The standard error estimates are robust to heteroscedasticity. Dummies are included for missing control variables. Summary statistics of the personal characteristics of the sample are shown in Table A1 in the supplementary file (Albert and Hajdu 2020).

We report unstandardized regression coefficients throughout the paper because the interpretation of these coefficients is more straightforward: they show the differences in the

social relations of the poor and the non-poor. Also, the conclusion of our analysis remains the same when using standardized coefficients.

### *3.4. Sample selection*

We exclude respondents with missing poverty indicators (701 observations, mostly due to the missing income variable). The final sample size is 1,986. Depending on the missing values of the dependent variables, the N of the regression models ranges from 1,662 to 1,986.

## **4. Results**

### *4.1. Size of social network*

Table 2 shows the results of the regressions on the indicators of the size of the social network. Of the three standard poverty indicators, only material deprivation correlates statistically significantly with the four variables. It is associated more strongly with the size of the core discussion network and with the number of friends than the other two standard poverty indicators. Those who live in material deprivation have 0.21 less persons in their CDN and 0.53 less friends than others not living in deprived households. These are substantial differences since they mean 9.6 per cent smaller CDNs and 19.4 per cent fewer friends.

Material deprivation correlates positively with the variable of the lack of social ties, whereas the coefficients on income poverty and on very low work intensity are insignificant. Regarding instrumental contacts (instrumental strong ties), low work intensity has the highest coefficient, but the effects of material deprivation are also negative and strongly significant.

The subjective indicator of poverty is associated as strongly as material deprivation with the size of the CDN and with the number of friends, and its effect is also significant regarding the other two dependent variables. For example, those who live in households with perceived financial problems have 0.23 (or 10.1 per cent) less people in their CDN and 0.54 (or 19.2 per cent) less friend than others living in households without financial problems.

*[TABLE 2 HERE]*

### *4.2. Composition of social network*

The three variables of social network composition provide information about resource strength. All poverty indicators correlate negatively with nexus diversity. Similarly, the four measures

of poverty are associated negatively with the share of educated people in the CDN, but income poverty and very low work intensity are not related to the average prestige of occupations in which the respondent knows at least one helpful person (Table 3). People living in poverty have 10 percentage point (or 20 per cent) less educated people in their close networks than others, which is in line with the homophily principle which structures networks and results in that they are homogenous with regard to many sociodemographic, behavioural, and intrapersonal characteristics, but which also limits people's social worlds with powerful implications for, among others, the resources available for them via their interpersonal ties (Bourdieu 1986; McPherson *et al.* 2001). People living in a household with very low work intensity indicates 1.6 less occupations they know and can get help from people having those jobs, which is a substantial 29.1 per cent difference. People living in income poverty know 1.3 less from the listed 21 occupations (22.5 per cent difference), whereas people living in severe material deprivation know 1.1 less occupations (19.7 per cent difference).

[TABLE 3 HERE]

#### 4.3. Subjective indicators

Poverty is associated strongly with the subjective indicators of social relationships (Table 4). As we may expect, in general, coefficients on the subjective poverty indicator (perceived financial problem) are the highest, however, coefficients on material deprivation are in one case even higher, and in two cases only slightly smaller than they are. Very low work intensity is unrelated to perceived social importance and is marginally related to satisfaction with family life. For example, those who live in material deprivation have 0.6 points higher score on the scale of perceived social exclusion than others not living in deprived households, which is a 29.7 per cent difference. Similarly, the social exclusion score of people living in income poverty is 18.3 per cent higher, whereas the same score of people living in households with financial problems is 22.2 per cent higher compared to people not in poverty.

It is worth highlighting that those living in poverty are less satisfied with their family life, i.e. poverty is associated negatively not only with relationships with friends or with a wider circle of acquaintances but also with family life and contacts with family members. This is in line with previous research pointing to the fact that poverty may be a significant source of interpersonal conflict (Conger *et al.* 1992; Czibere 2014). Overall, of the seven groups of social indicators, the association between subjective indicators and poverty is the strongest.

[TABLE 4 HERE]

#### 4.4. Social interactions

Since low/limited economic resources restrict social activities that require spending money (Stewart *et al.* 2009), we use a variable that measures the frequency of meeting friends at home. Meetings at home might require less money, thus any differences between the poor and non-poor are supposed to reflect the social and psychological consequences rather than the financial constraints of poverty. However, it is also possible that such differences emerge due to housing deprivation associated with poverty (Whelan *et al.* 2002) or due to differences in friendship patterns or in interactions with friends, which are also related to social status (Allan 1977; Allan 1998).

Table 5 shows that people living in poverty are more likely to report that they never or rarely meet friends at home. The largest difference is between those who live in severe material deprivation and those who are not. Materially deprived people have a 16.9 percentage point higher probability of having restricted social interactions with friends. This is a sizeable difference: the predicted probability of rarely meeting friends for non-deprived people is 27.1 per cent, whereas for materially deprived people it is 44.0 per cent.

Income poverty is associated least strongly with the frequency of social interactions, but the association is still strong: people living in monetary poverty are 25 per cent (or 7.9 percentage points) more likely to rarely meet friends at home.

[TABLE 5 HERE]

#### 4.5. Importance of other people

Variables indicating the perceived importance of other people capture the potential negative psychological or attitudinal consequences of poverty. Results in Table 6 show that income poverty is unrelated to the three variables, and low work intensity is only marginally associated with the importance of friends. Only severe material deprivation and perceived financial problems are associated with less importance of others in one's life. However, the size of coefficients is small and differences between poor and non-poor people are generally smaller (2-8 per cent) than in case of other indicators characterizing social ties.

[TABLE 6 HERE]

#### *4.6. Neighbourhood*

Except for very low work intensity, poverty measures are associated with the social quality of the neighbourhood (Table 7), however, coefficients of income poverty are only marginally significant. Poor people report that their neighbourhood has less positive and more negative social characteristics. Coefficients on severe material deprivation are the highest: the difference between those who live in material deprivation and those who don't is 0.24 standard deviation regarding the positive characteristics and 0.30 standard deviation regarding the negative characteristics. These results imply that poor people live in neighbourhoods with less favourable social networks and they might receive less social, emotional or economic support from their neighbours. Residential segregation, which is quite prevalent in Hungary as well, might be a background factor to this finding, as in segregated neighbourhoods neighbours are similarly poor and socially excluded (Kopasz 2004).

The results are similar when we use the two unequivocally positive characteristics (helping each other; openness and acceptance) and the two unequivocally negative characteristics (envy, rivalry; malignancy, hostility) as dependent variables. In this case, coefficients on material deprivation are the highest, and coefficients on perceived financial problems are the second highest.

*[TABLE 7 HERE]*

#### *4.7. Public participation*

Associations between the indicators of poverty and the two variables of public participation are less relevant compared to the previous results (Table 8). Participation in NGOs is less likely among people living in income poverty (by 3.6 percentage points), but it is unrelated to the other three poverty variables, whereas participation in political activities correlates negatively with very low work intensity, perceived financial problems, and material deprivation. These differences are large in magnitude (20-35 per cent) but are also imprecisely estimated.

*[TABLE 8 HERE]*

#### *4.8. Robustness of the results*

Next, we test the robustness of the results. First, we regress the indicators of social ties and social integration on all the four indicators of poverty, i.e. we use models that include all poverty indicators. The results of these 18 regression models are shown in the supplementary file (from Table A3 to Table A9). The differences between the four poverty indicators regarding the size of the coefficients and the p-values are very similar to the main models, therefore the results of these models do not alter the conclusions drawn from the main models. This also suggests that poverty measures are not strongly related and are reflecting distinct dimensions of poverty and social exclusion.

For the 13 binary or ordinal variables, we also estimate logit or ordered logit models that are more suitable for the binary or ordinal nature of these outcome variables. The results are shown from Table A10 to Table A14 in the supplementary file. The sign of the coefficients and the size of the p-values are very similar to the main results. The conclusion of this exercise is that the association of the poverty indicators with the social indicators is not altered by the alternative estimation methods.

We also estimated models where household size and marital status were excluded since these variables are connected strongly to poverty measures and also people who live together with others and who are married might not have the same need as others to have social relations. The results are shown in Table A15 in the supplementary file. In general, the size of the coefficients is slightly higher, but the conclusion is the same as in the main models.

### **5. Limitations**

This paper has a number of limitations. First, as we noted above, using cross-sectional data, we are not able to establish a causal relationship between the poverty indicators and social connectedness. Second, we use data from a single country that might raise concerns about the generalizability of the results. However, we do not know of any well-grounded theories suggesting that Hungary could be unique regarding the link between poverty and social connectedness. Indeed, previous studies show that post-communist countries are quite similar in this regard (e.g. Letki and Mierina (2015) analyzing data from the International Social Survey Program, or Böhnke (2008) using data from the European Quality of Life Survey). Third, the standard and widely used poverty variables are household-based while our outcomes are measured on the individual level. It is reasonable to suppose that resources are not equally

divided between the members of the households, which means that the individual poverty status was measured with bias. A possible solution would be to use datasets that measure detailed intra-household resource allocation and could provide some information on individual poverty of the household members. However, since our aim is to analyse which standard poverty indicators are linked most strongly with the indicators of social connectedness, this would not be ideal. Another direction could be to use household-level social relationship data that is rare and could raise other concerns about the distribution of these variables among the household members.

## **6. Discussion and conclusion**

In this paper, we have analysed the association between poverty indicators and various dimensions of interpersonal networks and social integration, using nationally representative data from Hungary. More specifically, we have analysed which poverty indicators are linked most strongly with the indicators of interpersonal networks and social integration. We have used four poverty indicators (three standard and widely used indicators of Eurostat: income poverty, severe material deprivation, very low work intensity, and an additional subjective indicator: perceived financial problems) and a rich set of indicators of social ties and social integration (size and composition of the social network, subjective indicators, social interactions, importance of other people, social quality of the neighbourhood, and public participation).

Our most important result is that of the four poverty indicators, material deprivation is most strongly linked to the measures of social ties and social integration (Table 9). Coefficients on material deprivation are highest or joint highest for 12 of the 18 dependent variables, they are among the two highest coefficients in 14 cases, and they are significant at the 5 per cent level in 16 cases. Income poverty seems to be associated least strongly with network and social integration indicators: the coefficients are significant at the 5 per cent level only in 6 cases and are among the two highest coefficients in only 3 cases. Consequently, these results are in line with the findings of Mood and Jonsson (2016) claiming that income poverty is a weaker predictor of social outcomes than material deprivation.

The subjective indicator of economic hardship (perceived financial problems) is related to social indicators almost as strongly as material deprivation. The coefficients are significant at the 5 per cent level in 16 cases, are among the two highest coefficients in 13 cases, however, are the highest coefficients only in 4 cases. We also note that the coefficients on this subjective

poverty variable are higher (in absolute terms) than coefficients on very low work intensity in 11 cases, and they are higher than coefficients on income poverty in 12 cases. This suggests that a subjective poverty indicator reflects the multi-dimensional nature of poverty better than indicators of income poverty or living in a household with very low work intensity. Of the latter two indicators, income poverty tends to be associated with the subjective indicators of social networks and social integration (including the quality of the neighbourhood), whereas low work intensity is more related to network size. It is important to note that living in a household with low work intensity is linked to both instrumental strong ties and the number of occupations in which the respondent knows at least one helpful person, which highlights the fact that participation in the labour market enhances the formation and mobilization of supportive ties and may provide access to resources unavailable within the family.

*[TABLE 9 HERE]*

In general, these findings are in line with the results of several previous papers that shows that poverty is negatively linked to indicators of interpersonal networks and social integration, not only to network size, to network composition or to the frequency of social interactions but also to neighbourhood quality, to subjective indicators and to the importance of other people. These previous results warn about the potential “downward spiral of social exclusion” (Mood and Jonsson 2016), i.e. about the risk that economic disadvantages may increase social disadvantages, and conversely, which together with other consequences of the lack of social relations and social disintegration (Putnam 2000; Wilkinson and Pickett 2010) might increase the negative effects of social exclusion.<sup>9</sup>

Our results support another finding of the previous literature (Böhnke and Link 2017; Canduela *et al.* 2015; Mood and Jonsson 2016). Although income poverty is associated with indicators of social relations and social integration, it is less strongly or not at all related to ties to family members and to other close relations, including the importance of these ties. Nevertheless, this does not mean that people living in disadvantaged economic circumstances have a similar number or similar quality of strong ties as more affluent members of society since the other three poverty indicators are associated with all or most measures of strong ties.

The strong links between severe material deprivation and the various social networks indices can be explained by the fact that the definition of income poverty is based only on household income, whereas material deprivation is determined by several factors not necessarily solely of a material nature (Fusco *et al.* 2010; Guio and Engsted Maquet 2007; Till and Eiffe 2010;



Whelan *et al.* 2004). Thus, our study also supports the claim that material deprivation encompasses both elements of poverty: not only the inadequacy of financial resources but also the inability to participate in wider society (Israel 2016). Our results also suggest that measuring the link between poverty and social connectedness depends in many cases on the applied indicators. Lastly, although this paper can't draw any conclusion about the causal relationship between poverty and social relations, the results unequivocally show that poor people have less and lower quality relationships. This means that regardless of the causal direction, policies aiming to reduce poverty have to take into account the social relations of the poor and should support the maintenance of existing ties and the (re)establishment of other relationships. This also corroborates the importance of interventions in social networks for community social work (e.g. Ennis and West 2010; Gilchrist 2019; Rodríguez and Ferreira 2018).

Overall, although income poverty is arguably the most widely used poverty indicator, our results suggest that severe material deprivation and even subjective poverty reflect better the multidimensional nature of poverty and social exclusion and their use should be further enhanced.

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## **Conflict of interest**

The Authors declare that there is no conflict of interest.

## **Supplementary tables**

Supplementary tables (Albert and Hajdu 2020) are available for download at <https://doi.org/10.6084/m9.figshare.12698015>.

## Notes

<sup>1</sup> The „at risk of poverty or social exclusion” (AROPE) rate is a headline indicator of the EU 2020 Strategy. It corresponds to the sum of persons who are either at risk of poverty, or severely materially deprived or living in a household with a very low work intensity (Eurostat 2018).

<sup>2</sup> For a more detailed discussion of the two hypotheses see Böhnke (2008).

<sup>3</sup> “Integrative and Disintegrative Processes in the Hungarian Society” doi:10.17203/KDK387 (<http://openarchive.tk.mta.hu/387/>)

<sup>4</sup> A working age adult is defined as a person aged 18-59, not being a dependent child. Dependent children include economically inactive persons aged 18 to 24 years. Respondents living in households with no working age adults are classified as not living in a household with very low work intensity. The results and the conclusion do not change when we restrict our sample to respondents aged 18-59.

<sup>5</sup> **Hiba! A hivatkozási forrás nem található.** in the supplementary file shows the factor loadings. The first two variables that measure social contacts and interpersonal interactions load strongly on the positive factor, but load also, however considerably less strongly, on the negative factor. Since social contacts and interactions are necessary for negative activities as well, we retain this factor structure. The reliability of the two factors measured by Cronbach’s alpha is good (0.780 and 0.775, respectively).

<sup>6</sup> The activities were the following: has contacted a politician, or local government official; worked in a political party or participated in its events; worked in another political organization or political movement; worn or displayed a political badge/sticker; signed a protest letter or petition (either on paper or on the Internet); taken part in a lawful public demonstration; boycotted certain products; and donated money to an NGO.

<sup>7</sup> Age, squared age, sex, marital status, education, labor force status, activity limitation, ethnicity, household size, type of settlement, and region. Similar control variables are used by Böhnke (2008) and Dahl et al. (2008).

<sup>8</sup> For ordinal dependent variables, we also estimate ordered logit models. The results are unchanged (see Section 4.8.). We have decided to use OLS, since interpreting the coefficients is easier.

<sup>9</sup> Of course, since we use cross-sectional data, we cannot draw causal inferences. However, previous research (e.g. Böhnke and Link 2017; Mood and Jonsson 2016) demonstrated the impact of poverty on social relations.

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## Tables

Table 1: Summary statistics of the main variables

	Mean	SD	Min	Max	N
Income poverty	0.129	0.336	0	1	1986
Severe material deprivation	0.232	0.422	0	1	1986
Very low work intensity	0.092	0.290	0	1	1986
Perceived financial problems	0.396	0.489	0	1	1986
Core discussion network	2.181	1.297	0	5	1986
Instrumental strong ties	2.090	1.288	0	5	1986
Number of friends	2.591	3.446	0	20	1947
Nexus diversity	5.473	4.468	0	21	1981
Social isolation	0.366	0.725	0	3	1947
Educated people in the CDN	0.487	0.440	0	1	1853
Average prestige of the occupations the respondent knows someone from	43.315	8.487	23	73	1732
Perceived social exclusion	2.132	0.883	1	5	1831
Perceived social importance	6.428	2.220	0	10	1939
Satisfaction with family life	8.138	2.128	0	10	1976
Never or rarely meeting friends	0.307	0.461	0	1	1985
Importance of family	4.756	0.608	1	5	1970
Importance of friends	3.765	1.197	1	5	1853
Importance of neighbours	3.250	1.179	1	5	1968
Neighbourhood: positive characteristics	-0.019	0.998	-3.061	2.536	1662
Neighbourhood: negative characteristics	0.018	1.017	-2.166	3.077	1662
Participation in NGOs	0.057	0.231	0	1	1986
Participation in political activities	0.230	0.421	0	1	1986

Table 2: Size of social network and poverty

	Core discussion network				Instrumental strong ties				Number of friends				Social isolation			
	B	SE	p	N	B	SE	p	N	B	SE	p	N	B	SE	p	N
Income poverty	-0.076	0.109	0.483	1986	-0.122	0.106	0.252	1986	-0.392	0.351	0.265	1947	0.054	0.061	0.381	1947
Severe material deprivation	-0.214	0.084	0.011	1986	-0.266	0.082	0.001	1986	-0.525	0.222	0.018	1947	0.167	0.051	0.001	1947
Very low work intensity	-0.119	0.113	0.293	1986	-0.352	0.117	0.003	1986	-0.427	0.312	0.172	1947	0.084	0.074	0.252	1947
Perceived financial problems	-0.228	0.075	0.002	1986	-0.163	0.074	0.028	1986	-0.538	0.204	0.008	1947	0.076	0.041	0.065	1947

Separate regression models for each poverty indicator. Control variables: age, squared age, sex, marital status, education, labour force status, activity limitation, ethnicity, household size, type of settlement, region. Dummies are included for missing regressors.

Table 3: Composition of social network and poverty

	Nexus diversity				Educated people in the CDN				Average prestige of the occupations the respondent knows someone from			
	B	SE	p	N	B	SE	p	N	B	SE	p	N
Income poverty	-1.266	0.330	0.000	1981	-0.092	0.027	0.001	1853	-0.167	0.322	0.603	1732
Severe material deprivation	-1.127	0.240	0.000	1981	-0.093	0.022	0.000	1853	-0.572	0.210	0.006	1732
Very low work intensity	-1.636	0.353	0.000	1981	-0.114	0.029	0.000	1853	0.316	0.385	0.412	1732
Perceived financial problems	-0.870	0.239	0.000	1981	-0.106	0.020	0.000	1853	-0.519	0.182	0.004	1732

Separate regression models for each poverty indicator. Control variables: see Table 2.

Table 4: Subjective indicators and poverty

	Perceived social exclusion				Perceived social importance				Satisfaction with family life			
	B	SE	p	N	B	SE	p	N	B	SE	p	N
Income poverty	0.383	0.083	0.000	1831	-0.552	0.188	0.003	1939	-0.598	0.190	0.002	1976
Severe material deprivation	0.595	0.057	0.000	1831	-0.673	0.146	0.000	1939	-0.811	0.148	0.000	1976
Very low work intensity	0.262	0.095	0.006	1831	-0.122	0.215	0.572	1939	-0.352	0.211	0.096	1976
Perceived financial problems	0.436	0.049	0.000	1831	-0.742	0.127	0.000	1939	-0.724	0.117	0.000	1976

Separate regression models for each poverty indicator. Control variables: see Table 2.

Table 5: Social interactions and poverty

	Never or rarely meet friends at home			
	B	SE	p	N
Income poverty	0.079	0.037	0.034	1946
Severe material deprivation	0.169	0.029	0.000	1946
Very low work intensity	0.100	0.041	0.016	1946
Perceived financial problems	0.121	0.024	0.000	1946

Separate regression models for each poverty indicator. Control variables: see Table 2, additional control variable: number of friends.



Table 6: Importance of other people and poverty

	Family				Friends				Neighbours			
	B	SE	p	N	B	SE	p	N	B	SE	p	N
Income poverty	-0.097	0.061	0.113	1970	-0.057	0.102	0.575	1853	-0.102	0.101	0.311	1968
Severe material deprivation	-0.144	0.045	0.001	1970	-0.192	0.083	0.020	1853	-0.273	0.073	0.000	1968
Very low work intensity	-0.046	0.065	0.474	1970	-0.204	0.118	0.085	1853	-0.022	0.105	0.836	1968
Perceived financial problems	-0.104	0.036	0.004	1970	-0.160	0.067	0.017	1853	-0.131	0.064	0.042	1968

Separate regression models for each poverty indicator. Control variables: see Table 2.

Table 7: Social characteristics of neighbourhood and poverty

	Positive characteristics				Negative characteristics			
	B	SE	p	N	B	SE	p	N
Income poverty	-0.178	0.100	0.076	1662	0.175	0.091	0.055	1662
Severe material deprivation	-0.240	0.070	0.001	1662	0.304	0.070	0.000	1662
Very low work intensity	0.000	0.105	0.998	1662	0.024	0.096	0.806	1662
Perceived financial problems	-0.182	0.060	0.002	1662	0.118	0.059	0.046	1662

Separate regression models for each poverty indicator. Control variables: see Table 2.

Table 8: Public participation and poverty

	Participation in NGOs				Participation in political activities			
	B	SE	p	N	B	SE	p	N
Income poverty	-0.036	0.018	0.050	1986	-0.045	0.035	0.188	1986
Severe material deprivation	0.013	0.017	0.435	1986	-0.048	0.026	0.071	1986
Very low work intensity	-0.010	0.020	0.623	1986	-0.082	0.037	0.026	1986
Perceived financial problems	-0.021	0.015	0.150	1986	-0.050	0.024	0.035	1986

Separate regression models for each poverty indicator. Control variables: see Table 2.

Table 9: Summary of the regression models (18 dependent variables, separate regressions for each poverty indicator)

	Significant at the 5 per cent level	Significant at the 10 per cent level	Highest or joint highest coefficient	Among the two highest coefficients
Income poverty	6	9	1	3
Severe material deprivation	16	17	12	14
Very low work intensity	6	8	5	6
Perceived financial problems	16	17	4	13